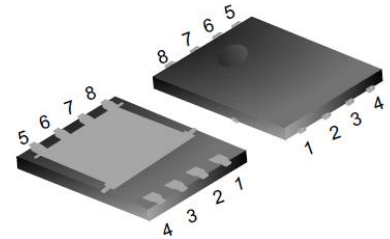


90A,100V N-CHANNEL POWER MOSFET

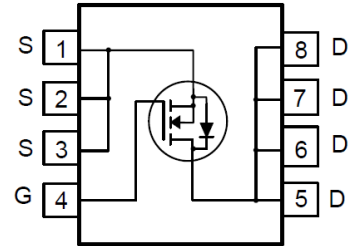
Features

- $R_{DS(on)}=6.3m\Omega$ (Typ.) @ $V_{GS}=10V, I_D=50A$
- Low gate charge
- Low on-resistance
- Fast switching



Applications

- Power factor correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible Power Supply (UPS)



Key Performance and Package Parameters

Order codes	V_{DS}	I_D	$R_{DS(ON)}$, Typ	T_{vjmax}	Marking	Package
XD6R3S010AK1Y8	100V	90A	6.3m Ω	150 $^{\circ}C$	D6R3S10AK1	PDFN-8-5X6X0.95-1.27

Absolute Maximum Ratings (T_c= 25 $^{\circ}C$ unless otherwise noted.)

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current (T _c =25 $^{\circ}C$)	90	A
I_{DM}	Pulsed Drain Current	360	A
P_D	Maximum Power Dissipation (T _c =25 $^{\circ}C$)	119	W
E_{AS}	Avalanche Energy, Single Pulse (note1)	272	mJ
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Conditions	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Steady State)	PDFN-8-5X6X0.95-1.27	1.05	$^{\circ}C/W$

Electrical Characteristics ($T_c=25^\circ\text{C}$ unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate Leakage Current, Forward	$V_{GS}=20V, V_{DS}=0V$	---	---	100	nA
	Gate Leakage Current, Reverse	$V_{GS}=-20V, V_{DS}=0V$	---	---	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2.0	---	3.5	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=50A$	---	6.3	7.0	$m\Omega$
Q_g	Total Gate Charge	$V_{DD}=50V$	---	48	---	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=10V$	---	22	---	nC
Q_{gd}	Gate-Drain Charge	$I_D=25A$	---	7.4	---	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, V_{GS}=10V$ $I_D=25A, R_G=1.6\Omega$	---	23	---	ns
t_r	Turn-on Rise Time		---	51	--	ns
$t_{d(off)}$	Turn-off Delay Time		---	39	---	ns
t_f	Turn-off Fall Time		---	12	---	ns
C_{iss}	Input Capacitance	$V_{DS}=50V$	---	3458	---	pF
C_{oss}	Output Capacitance	$V_{GS}=0V$	---	454	---	pF
C_{rss}	Reverse Transfer Capacitance	$f=1\text{MHz}$	---	12	---	pF

Diode Characteristics ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{SD}	Diode Forward Voltage	$I_S=50A, V_{GS}=0V$	---	---	1.4	V
t_{rr}	Diode Reverse Recovery Time	$I_S=25A,$ $di_f/dt=100A/\mu s$	---	59	---	ns
Q_{rr}	Diode Reverse Recovery Charge		---	0.1	---	μC

Notes:

1. $V_{DD}=80V, L=0.5mH, R_G=25\Omega$, starting, $T_J=25^\circ\text{C}$.

Typical Characteristics

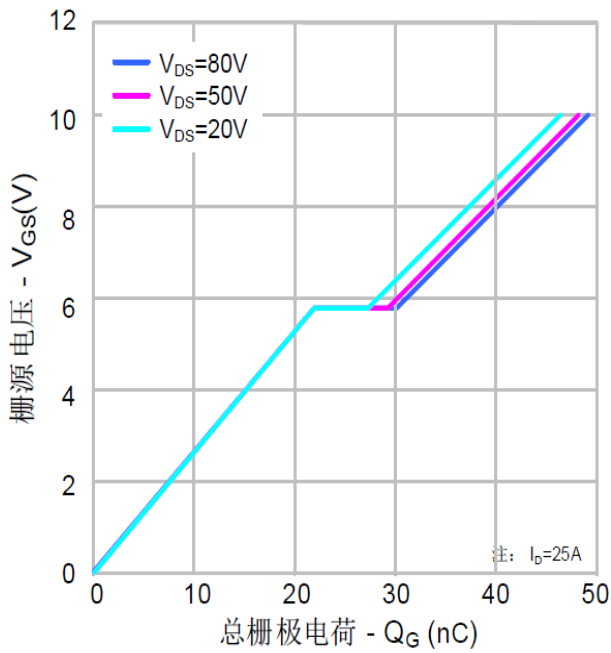


Fig.1 Gate Charge

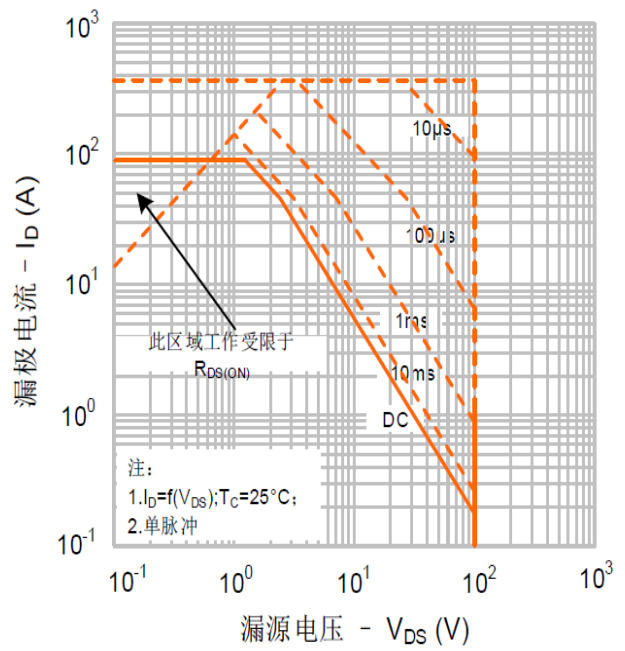


Fig.2 Safe Operation Area

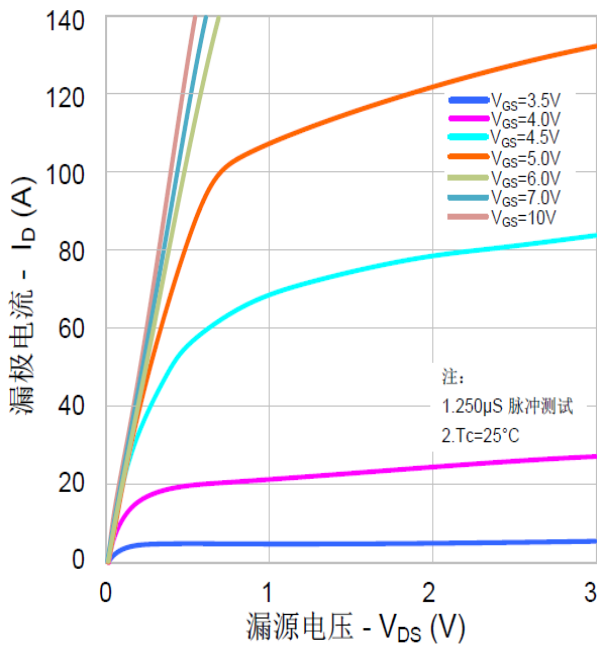


Fig.3 Output Characteristics

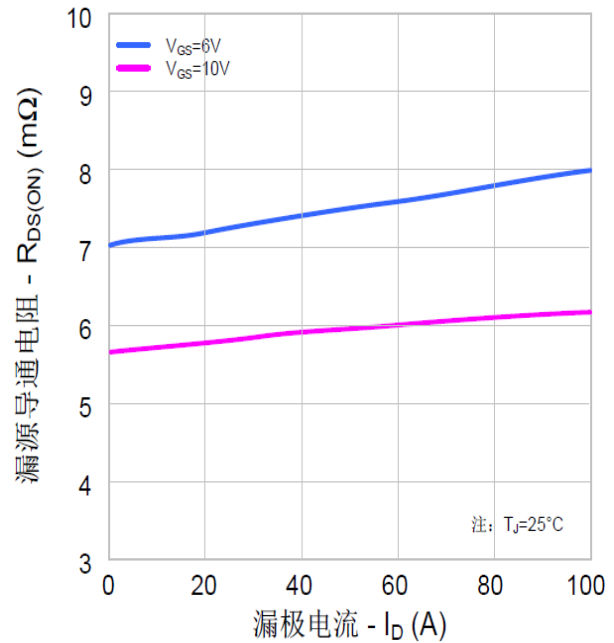


Fig.4 Drain-Source On Resistance

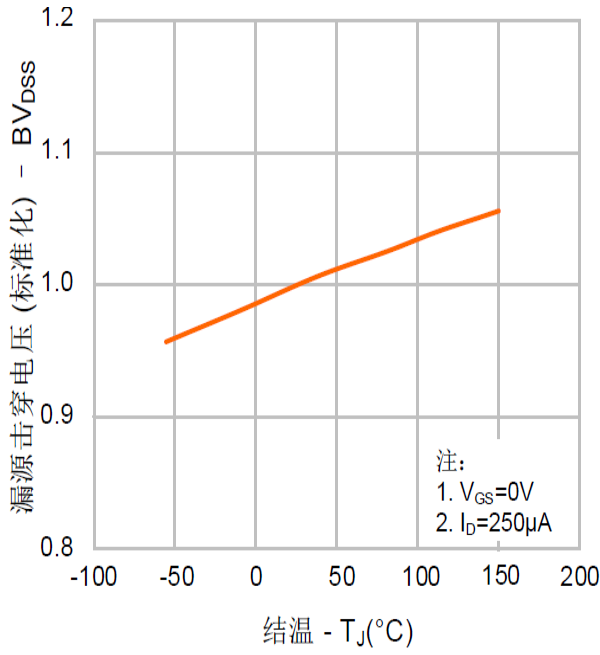


Fig.5 Drain-Source Breakdown Voltage

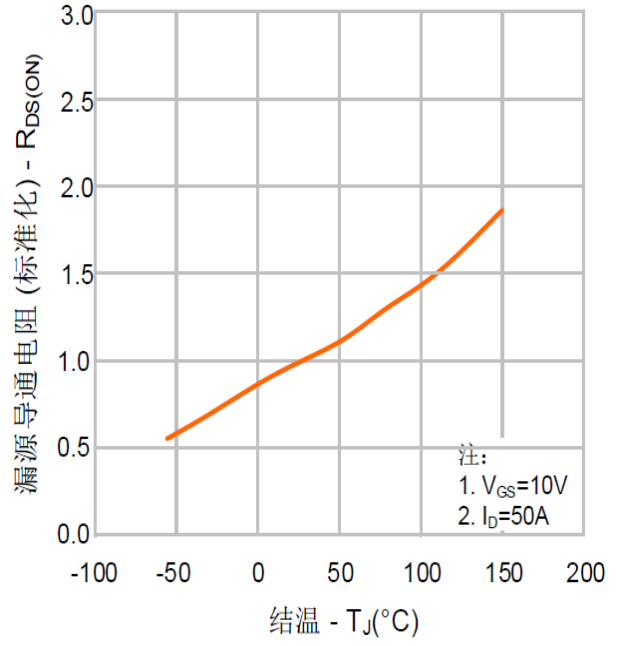


Fig.6 Drain-Source On Resistance

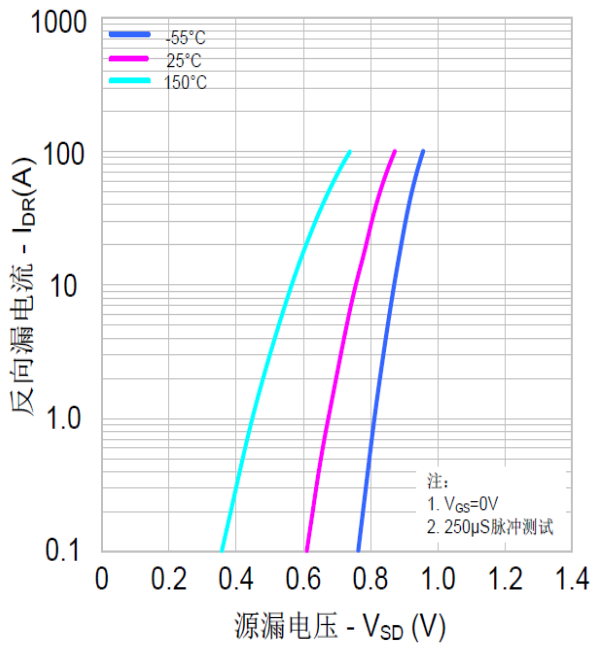


Fig.7 Source-Drain Diode Forward Current

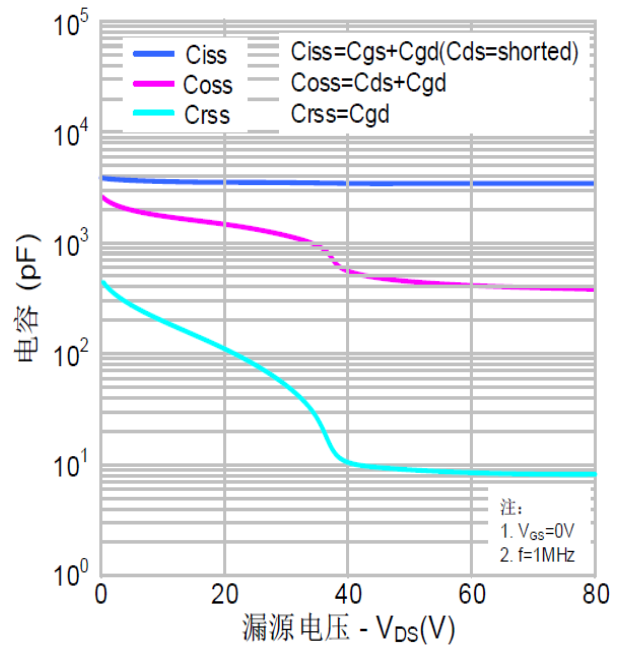
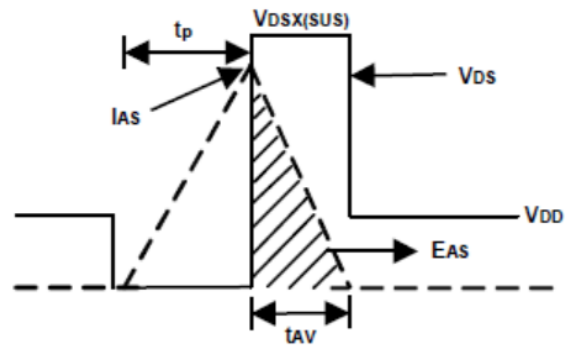
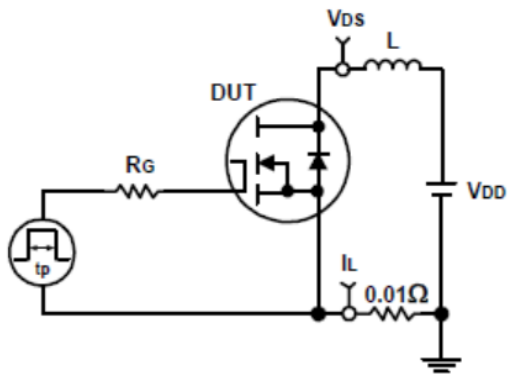
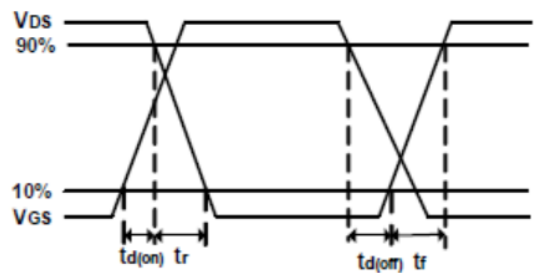
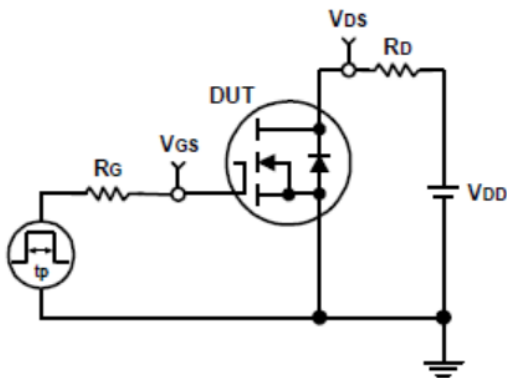


Fig.8 Capacitance

Avalanche Test Circuit and Waveforms

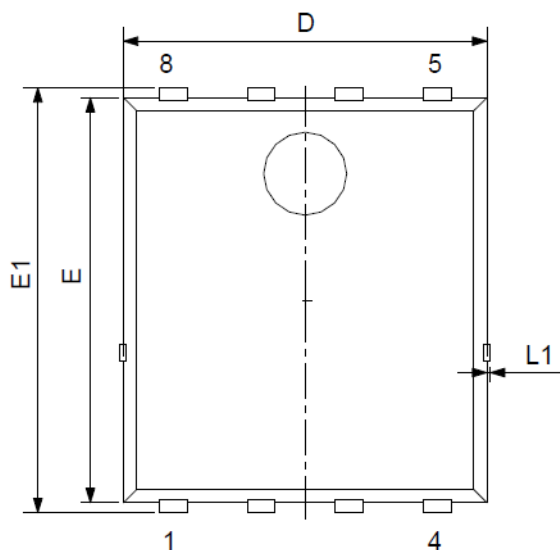


Switching Time Test Circuit and Waveforms

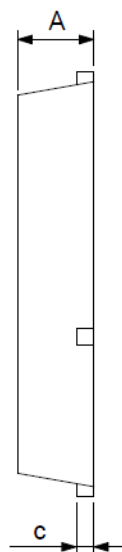


Package Information

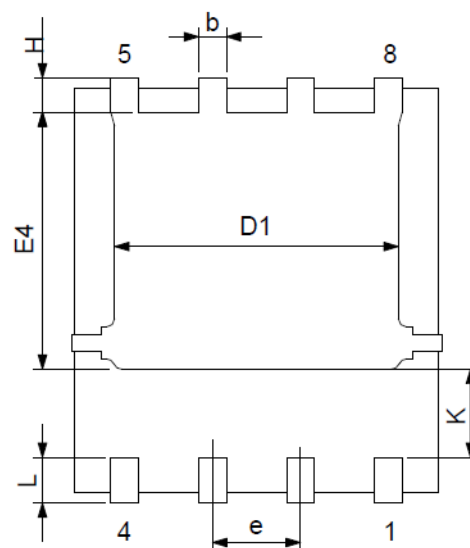
PDFN-8-5X6X0.95-1.27



Top View



Side View



Bottom View

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.90	—	1.20
c	0.154	0.25	0.354
D	4.80	—	5.40
E	5.66	—	6.06
D1	3.76	—	4.30
E1	5.90	—	6.35
b	0.30	—	0.55
K	1.10	1.30	1.50
e	1.07	1.27	1.37
E4	3.34	—	3.92
L	0.30	0.60	0.71
L1	—	—	0.12
H	0.40	—	0.71